Montana DNRC Forestry Division

FIRE AND AVIATION MANAGEMENT

- Aviation
- Equipment Development and Support
- Fire Prevention
- Fire Suppression
- National Fire Plan
- Training

Aviation

Providing Professional Aviation Support for all DNRC Functions

DNRC AIR OPERATIONS

Montana Department of Natural Resources and Conservation

Forestry Division
Fire and Aviation Management Bureau
Aviation

The Department of Natural Resources and Conservation's (DNRC) Aviation Section provides professional aviation support for all DNRC functions and for the Remediation Division of the Montana Department of Environmental Quality. Program responsibilities include providing mission-capable aircraft and aircraft support; seasonal pilot hiring and training; development, maintenance, and operation of aircraft; and providing training for ground-based firefighters who work in coordination with air operations.

DNRC's fleet of ten aircraft consists of three Cessna 180 airplanes, five Bell UH–1 helicopters, and two Bell Jet Ranger helicopters. These aircraft and their pilots and crews help protect the 5.2 million acres for which the DNRC has direct protection responsibilities, and help provide secondary protection to an additional 45 million acres protected through the State/County Cooperative Fire Program. The DNRC's Aviation Section is based at the Helena Airport, where the program maintains a hanger for aircraft development, maintenance, and storage.

Accomplishments
FY 2006

Fire detection	679 hours
Fire suppression	743 hours
Water delivered	2,159,106 gallons
Fire administration	99 hours
Fire training	27 hours
Non-fire missions	7 hours
Total hours	1,573

Goal

Maintain pilot proficiency and provide mission-capable aircraft to support Departmental missions efficiently and safely.

The Importance of Air Operations to Containing the Costs of Wildfires

DNRC Air Operations are integral to the implementation of the agency's initial wildfire attack strategy. DNRC's goal is to contain 95% of direct protection wildfires before they reach 10 acres in size. During the past decade, dedicated firefighters have actually exceeded this goal, successfully containing 96% of fires before they reached 10 acres in size. Successful initial attack does more than just suppress fires; it also minimizes risks to firefighters, lives, property, and natural resources, and helps contain the costs of fire suppression. Most of Montana's fire suppression costs are incurred in fighting the 4% of fires that exceed 10 acres.

DNRC's Cessna airplanes are used for fire detection patrol flights during the wildfire season, and its helicopters are equipped to carry water to fires. The larger UH–1 helicopters can also transport firefighting ground crews. Helicopters and their crews are often the first to arrive at a wildfire, and thus have a key role in initial attack and achieving the agency's fire suppression goals. Thus, through its fire detection patrols and the rapid initial attacks made possible by its aircraft, the Aviation Section plays a central role in controlling wildfires and helping to save tax dollars.

Aircraft

The Aviation Section operates and maintains three types of aircraft: five Bell UH–1 ("Huey") helicopters, two Bell Jet Ranger helicopters, and three Cessna 180 airplanes.

Bell UH–1 ("Huey") helicopters are used primarily for rapid initial attack fire suppression. These helicopters can carry a firefighting crew to work on the ground in tandem with aviation resources. Each helicopter is equipped with a 324 gallon water bucket and 150 feet of long line that can deliver water or equipment to firefighters on the ground. The newest DNRC UH–1 goes wherever need is greatest; the others are based in Missoula, Helena, and Kalispell.

The Bell Jet Ranger is smaller than the UH–1 and carries a smaller payload, but is still very effective for fire reconnaissance and initial attack in lighter fuels. These helicopters are equipped with a 100 gallon water bucket and long line. DNRC owns one Jet Ranger and has access to another owned by the Montana Department of Environmental Quality. Both helicopters are based in Helena.

Bell UH–1

Bell Jet Ranger, foreground; Bell UH–1 in background

Cessna 180

Fixed-wing Cessna 180s are used for fire detection patrol flights. Aerial patrols are an efficient means to locate new fires and communicate information to fire managers, who can then send appropriate suppression resources to the fire. Patrols are flown after periods of thunderstorm activity to detect lightning-ignited fires, and are often flown daily during periods of increased fire activity or fire danger. DNRC's three planes are based in Missoula, Helena, and Kalispell.

Development and Maintenance

DNRC's five Bell UH–1 helicopters and Bell Jet Ranger were acquired through the Federal Excess Property Program (FEPP). Through this program, used federal property is acquired by the USDA Forest Service for loan to the states for use in wildland fire protection. By acquiring helicopters and parts through the FEPP, DNRC saves millions of dollars for Montana taxpayers. Montana is one of a just a handful of states to use aircraft from the FEPP in its wildfire fighting program, and is able to do so through a combination of 40 years of experience with the FEPP and the knowledge and skills its staff bring to the task.

When the Aviation Section acquires a used helicopter through the FEPP, it totally disassembles the aircraft to assess needs for repair and parts replacement, and rebuilds what is functionally a new helicopter. The rebuilding process also includes the numerous modifications necessary to equip the helicopter for firefighting.

Opposite, top photo: Annual maintenance work on a UH–1.

Opposite, bottom photo: Maintenance work on the tail section of the helicopter.

Below, from left to right: Bell UH–1 helicopter that has not yet been developed; UH–1 developed in 2004 but not yet painted; completed UH–1.

Firefighting

Aviation resources have key roles in wildfire detection and suppression. DNRC's Cessnas make daily patrol flights for wildfire detection during the wildfire season. When fires are detected, DNRC's helicopters can transport water to help suppress the fire and also transport on-the-ground firefighting crews to the scene. The minimum "helitack" crew is a pilot and helicopter manager, an on-the-ground firefighter who coordinates between aviation and firefighting. Each UH–1 can carry a total crew of 8, including the pilot and helicopter manager. The helicopters can transport a bucket of water every 4 minutes, on average. A UH–1 with a 324-gallon bucket can transport an average of 38,800 gallons a day.

Personnel and Training

The Aviation Section staff includes two full-time pilots and two full-time mechanics. Because of the seasonality of wildfires, most of Aviation's positions are seasonal. Aviation hires a seasonal pilot for each of the UH–1 helicopters and 10 part-time relief pilots that fly the Cessnas and Bell Jet Rangers. The full-time pilots provide relief to the other pilots in the program as needed.

Aviation looks for pilots with a minimum of 1,500 in-command flight hours and 200 hours of experience flying a UH–1 for its seasonal pilots. Most new pilots require additional training to develop the skills needed for firefighting. Much of the initial training is devoted to learning how to safely and effectively use the long line and water bucket, a challenging skill to master.

Long line and water bucket in use, as seen from inside a helicopter.

The most recently developed of the UH–1 helicopters DNRC has obtained through the FEPP was developed in 2004 and 2006. The cost to develop this helicopter was $266,000, far less than the $3 million cost of a new helicopter or a used helicopter that had been redeveloped commercially to a comparable condition and specifications.

DNRC also obtains many parts for its helicopters through the FEPP. The Aviation Section acquired 12 Cobra helicopters in 2003 for use of parts in maintenance of the UH–1 helicopters. The total parts value was $18 million, but DNRC's cost was only $70,000 for shipping the helicopters from New York to Montana.

Each of DNRC's aircraft undergoes complete annual maintenance according to aviation industry standards. Each aircraft is prepared to perform flawlessly not only in the inherently risky business of flying, but also in the especially hazardous conditions surrounding wildfires.

DNRC AIR OPERATIONS

- **Safe:** DNRC Air Operations has over 40 years of accident-free flying. Air Operations aircraft have logged 45,210 accident-free flight hours.
- **Effective:** Initial attacks have contained 96% of wildfires before they reach 10 acres in size.
- **Economical:** Use of equipment loaned through the Federal Excess Property Program saves Montana taxpayers millions of dollars.

DNRC achieves significant cost savings by maintaining a fleet of aircraft, as illustrated by the following tables which compare the operating costs of DNRC's fleet to the operating costs of contract aircraft.

Bell UH–1	DNRC Air Operations	Contract Aircraft
Cost/flight hour	$875	$2,537
Fixed costs/day	$293	$6,081
Total flight hours	750	750
Total cost	$1,191,553	$4,943,250

Bell Jet Ranger	DNRC Air Operations	Contract Aircraft
Cost/flight hour	$355	$630
Fixed costs/day	$299	$1,100
Total flight hours	100	100
Total cost	$254,488	$283,000

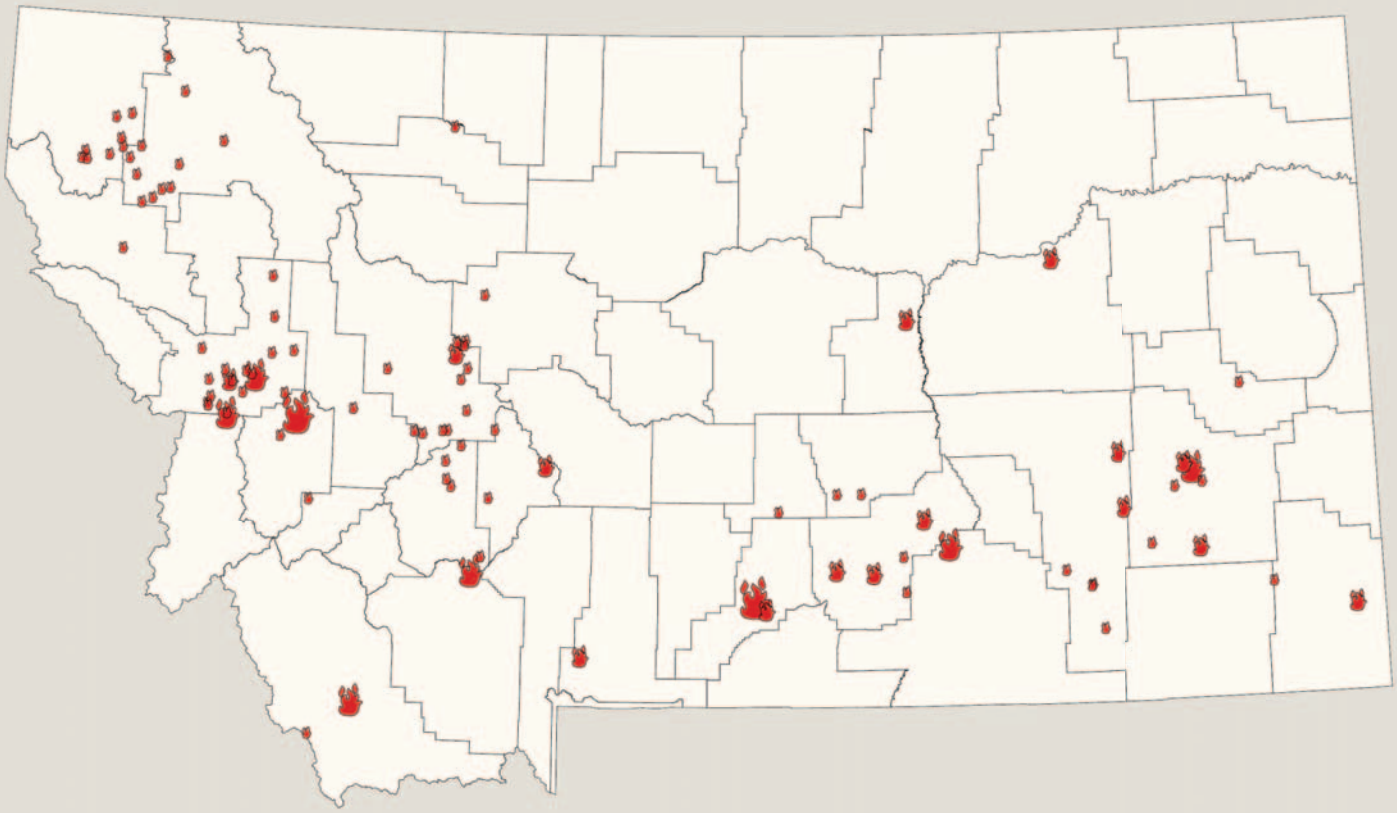
Cessna 180	DNRC Air Operations	Contract Aircraft
Cost/flight hour	$95	$350
Fixed costs/day	$52	$387
Total flight hours	600	600
Total cost	$113,775	$326,100

Figures based on aircraft rates for fiscal year 2006. Fixed daily costs reflect 365 day availability for DNRC Air Operations aircraft and 100 day availability during core fire season (June 15 through September 15) for contract aircraft. DNRC Air Operations daily fixed costs based on $811,066 annual base budget for fixed costs (personal services, insurance, and rent) distributed by aircraft hourly rate (66% for UH-1, 27% for Bell Jet Ranger, and 7% for Cessna aircraft). Total costs for each aircraft type calculated by multiplying hourly costs by flight hours (these are totals that include all aircraft of a particular type – 5 UH–1, 2 Jet Rangers, and 3 Cessnas), multiplying daily fixed costs by number of days of availability and number of aircraft, and taking the sum.

Annual DNRC Aviation Costs: $1,559,816

Estimated Costs Using Equivalent Contract Aircraft: $5,552,350

Water Delivered by DNRC Air Operations Helicopters 2006 Fire Season



Gallons of Water Delivered to Wildfires*

- 300 – 25,000
- 25,001 – 60,000
- 60,001 – 125,000
- 125,001 – 250,000

*A total of 2,159,106 gallons of water was delivered by DNRC helicopters to fire suppression operations carried out through the Direct Protection Program and the State/County Cooperative Fire Program. Because many fires occurred in close proximity, the clustering of symbols on the map prevents displaying the location of a number of smaller fires where water was delivered.

Top cover photo of the Robert Fire by Karen Nichols, *Daily Inter Lake*, Kalispell, MT.

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